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Beutel et al.

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(54) **POWER DRIVEN HAIR CLIPPER**

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(52) **U.S. Cl.** **30/216**; 30/34.1
(58) **Field of Search** 30/43.92, 527, 30/530, 531, 529, 43.6, 216, 199, 34.1

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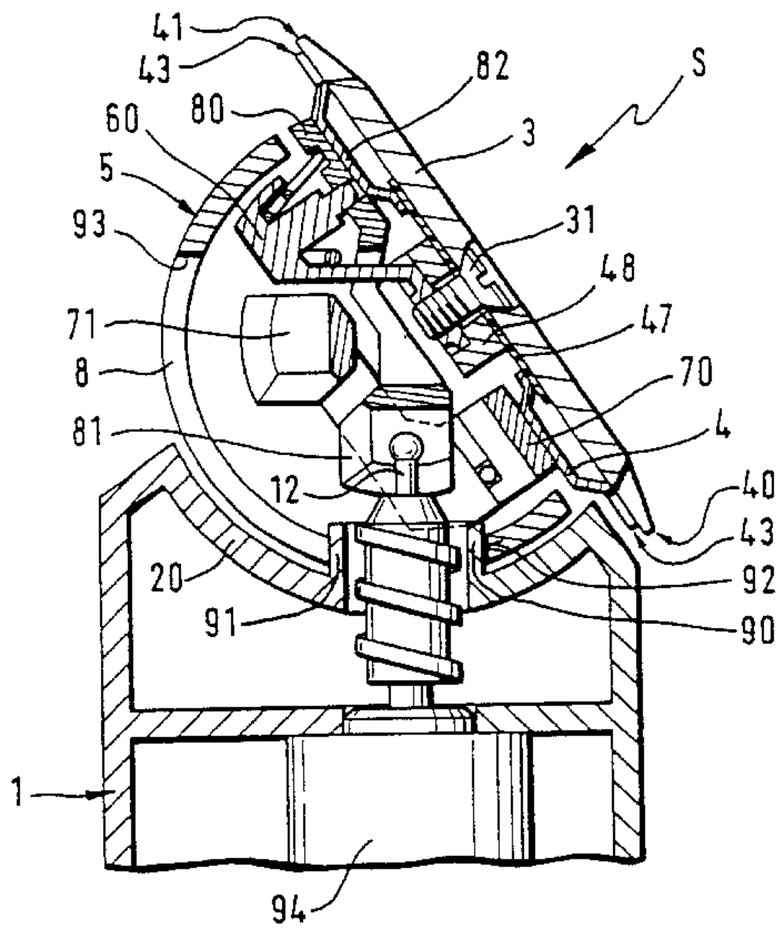
(57) **ABSTRACT**

The invention is directed to a power driven hair clipper (HSM), comprising a drive mechanism provided in a housing **(1)** and a clipper head (S) equipped with a clipper comb **(3)** and a clipper blade **(4, 82)** and mounted on said housing **(1)** for pivotal motion about a pivot axis (Z), wherein the clipper comb **(3)** is in cooperating relationship with two clipper blades **(4, 82)**, each being adapted to be coupled with a drive member **(12)** of the drive mechanism according to the pivot position of the clipper head (S) relative to the housing **(1)**.

55 Claims, 9 Drawing Sheets



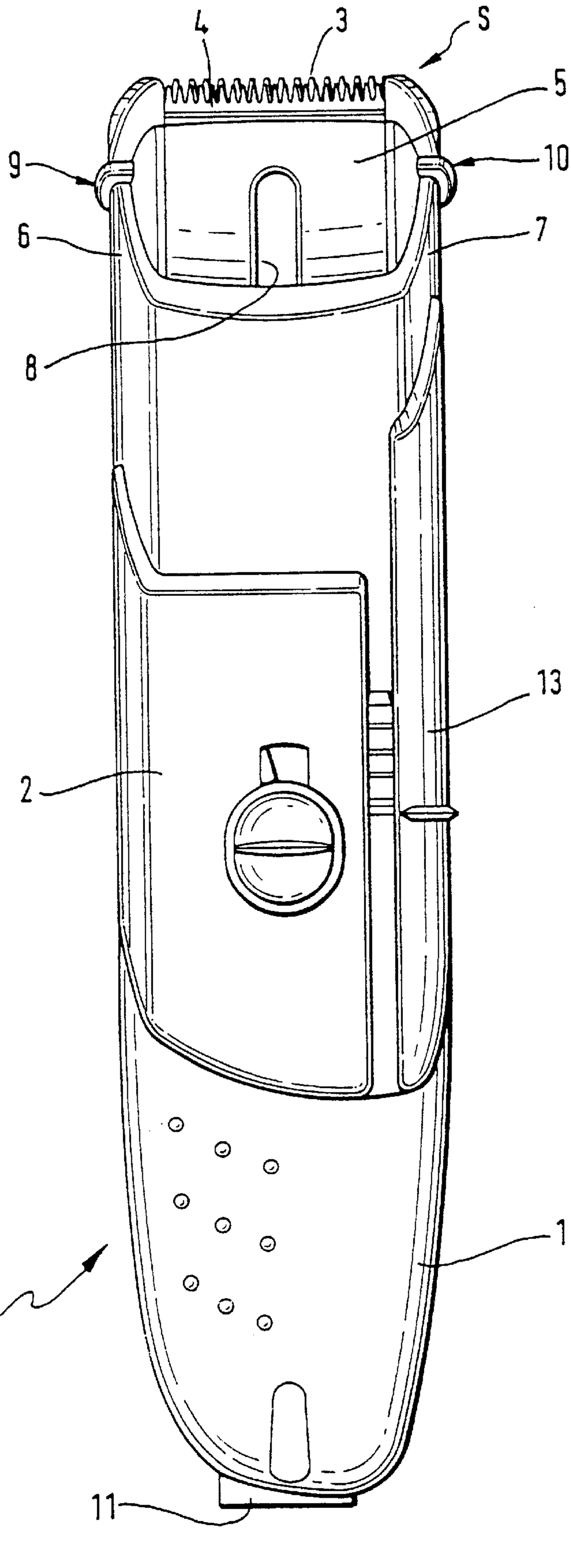


Fig. 1

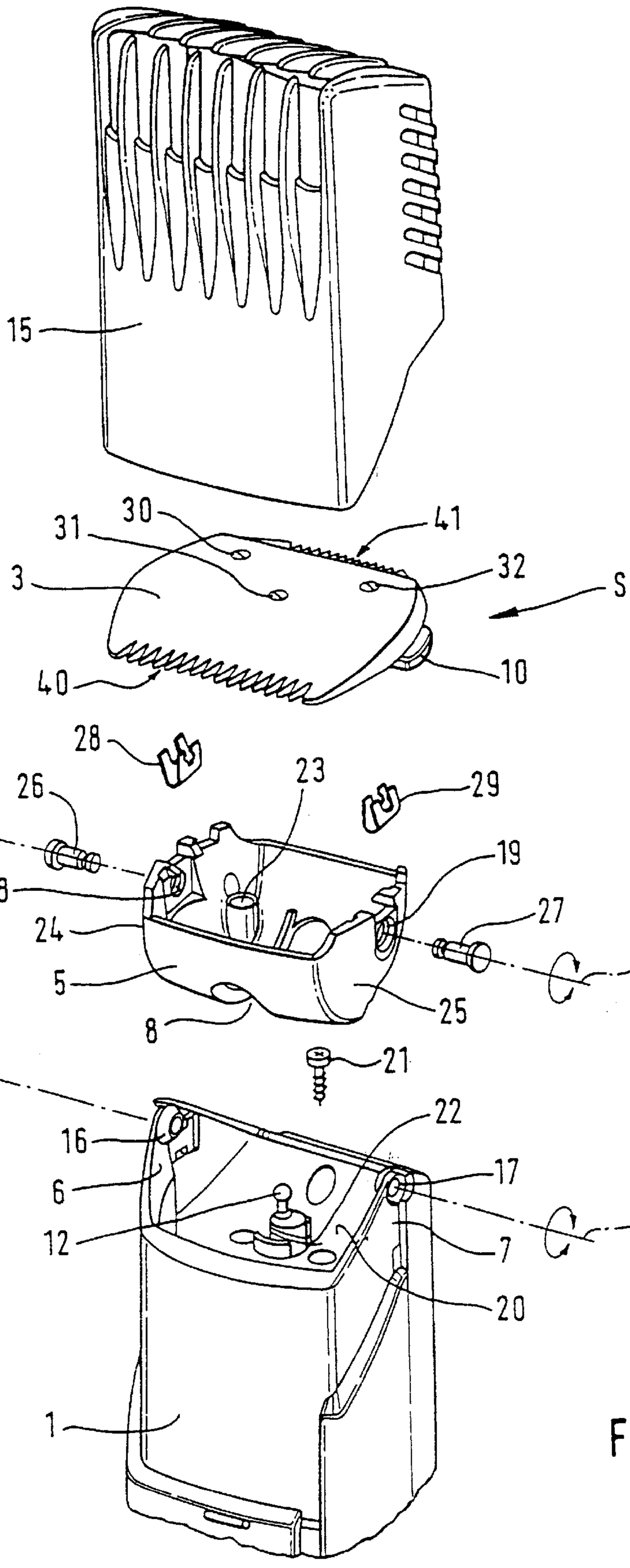

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Fig. 2

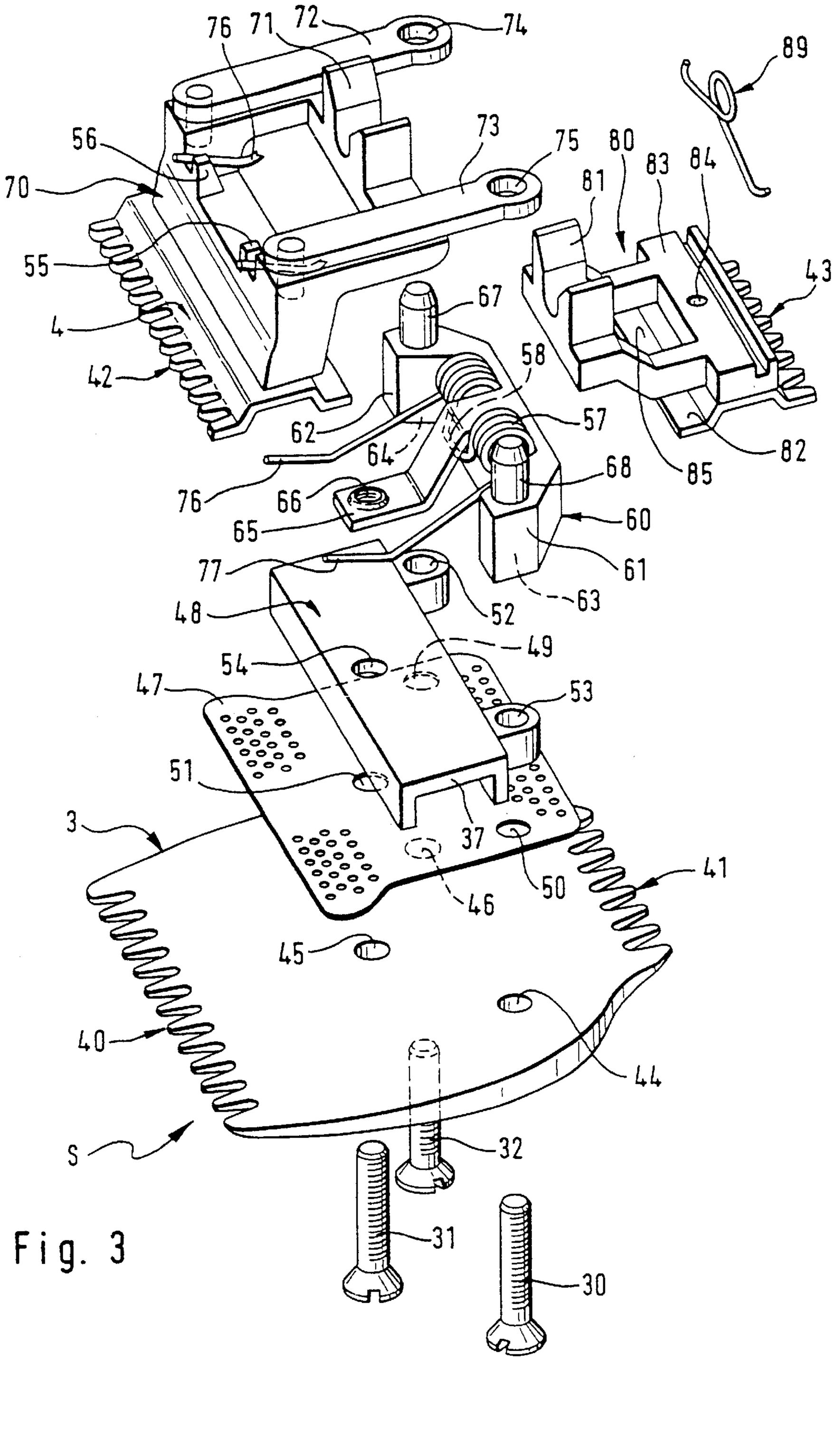
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Fig. 3

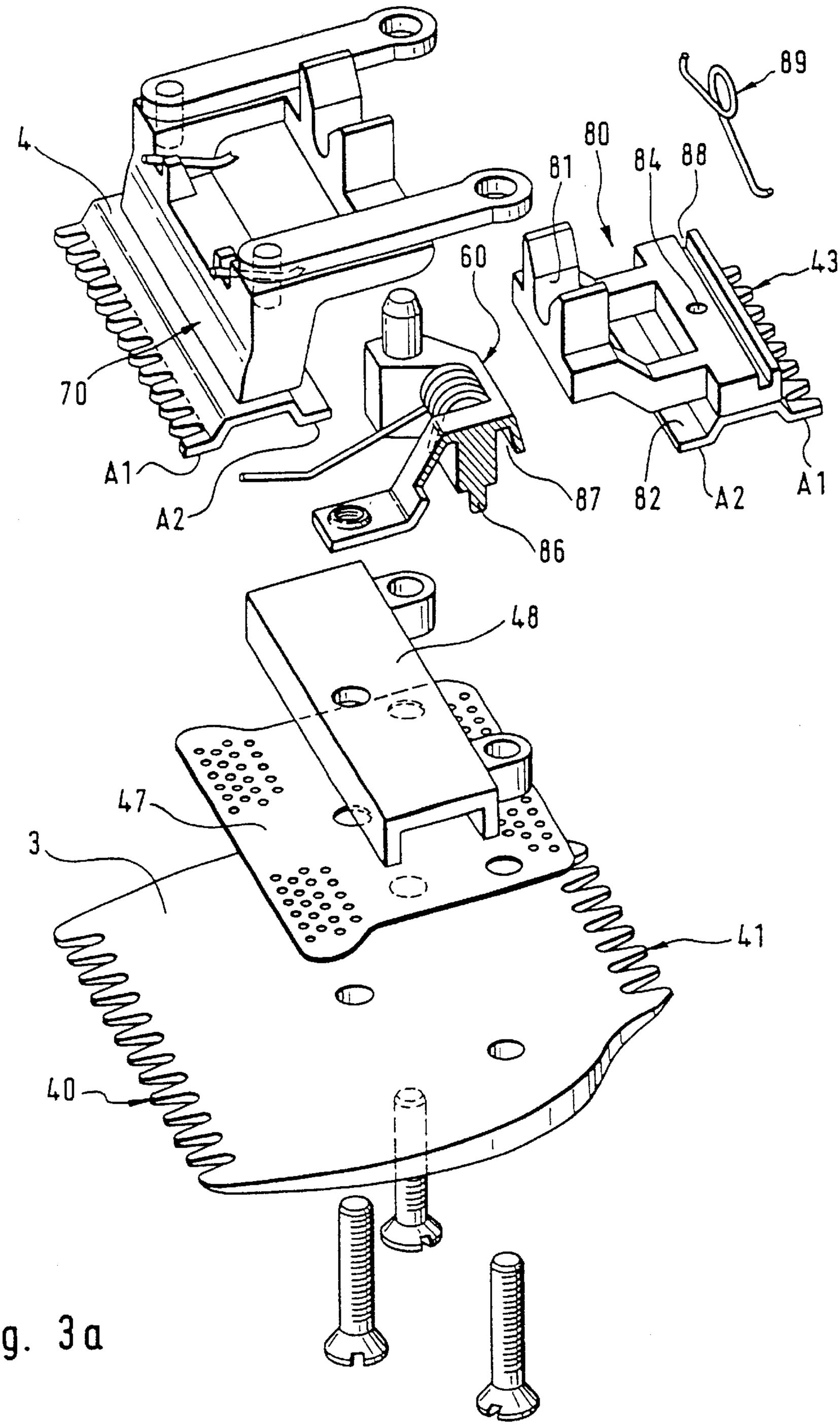

Fig. 3a

Fig. 4

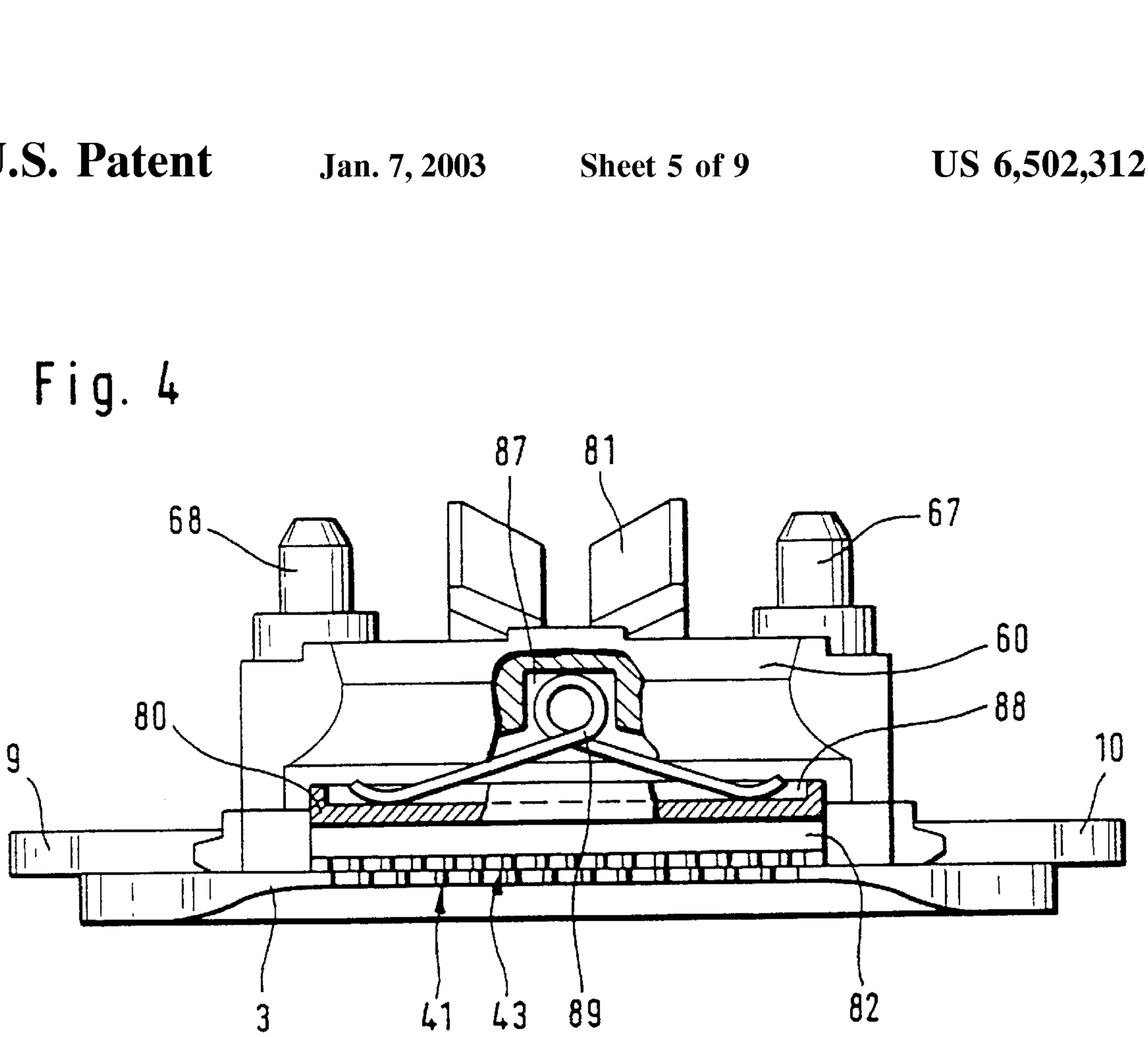
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Fig. 5

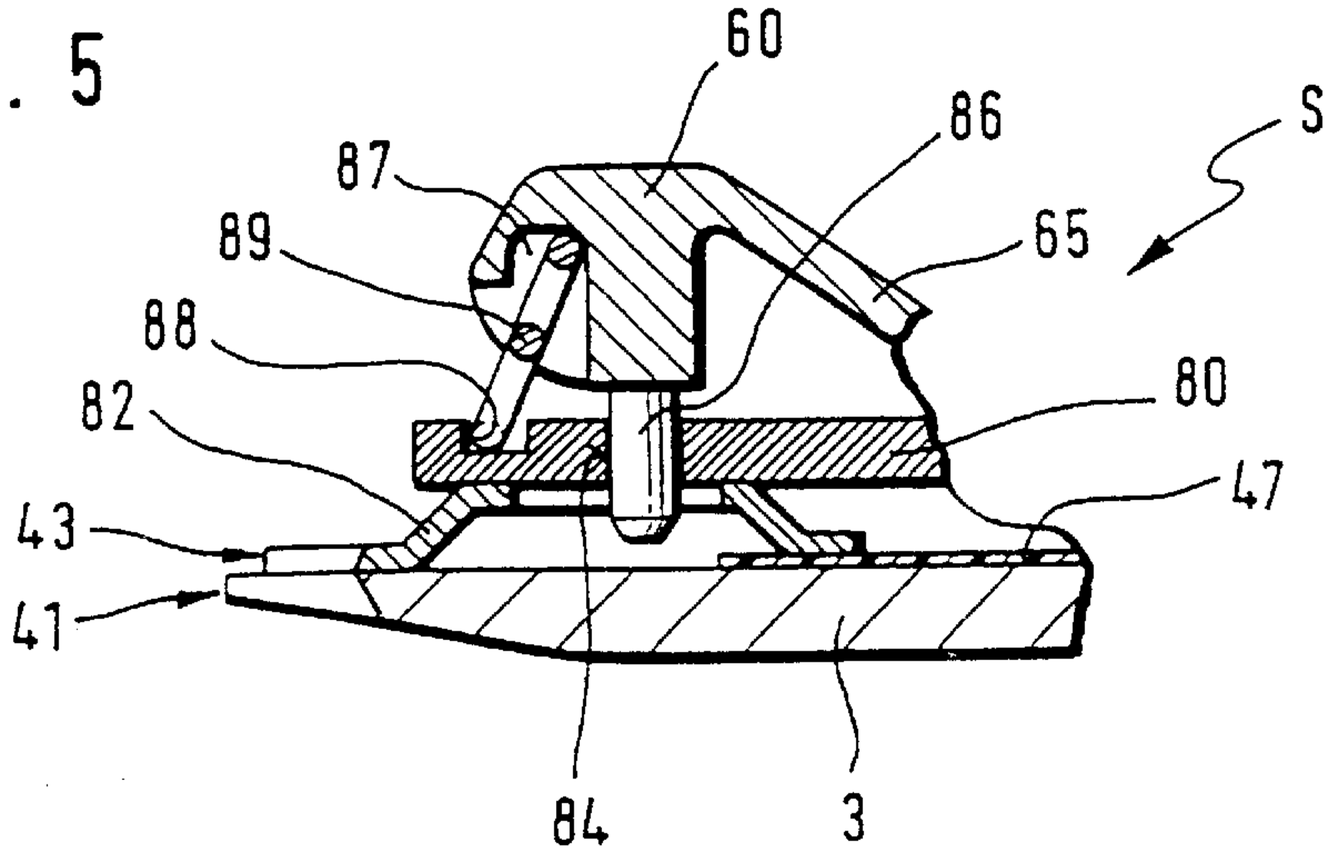
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Fig. 6

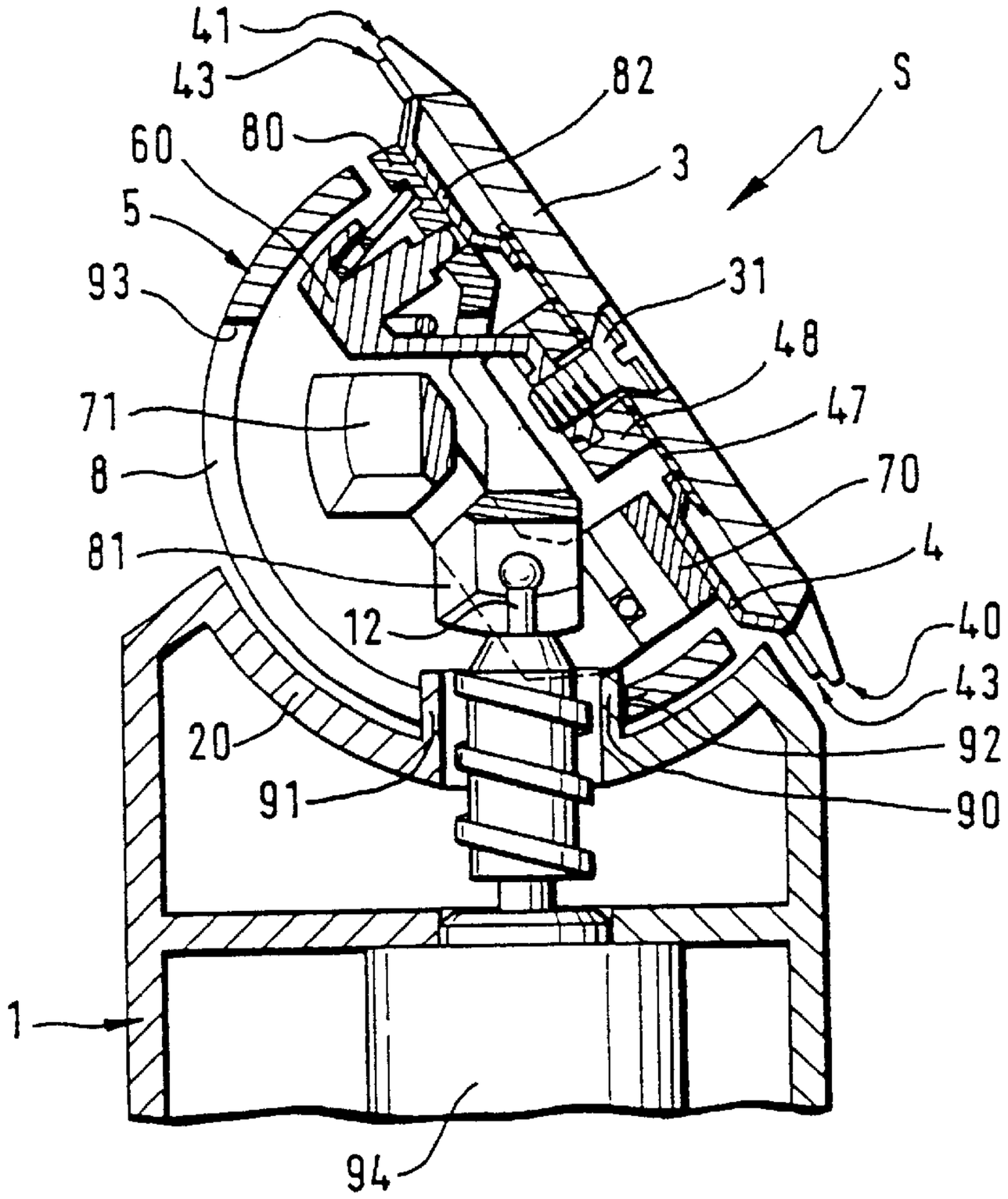
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Fig. 7

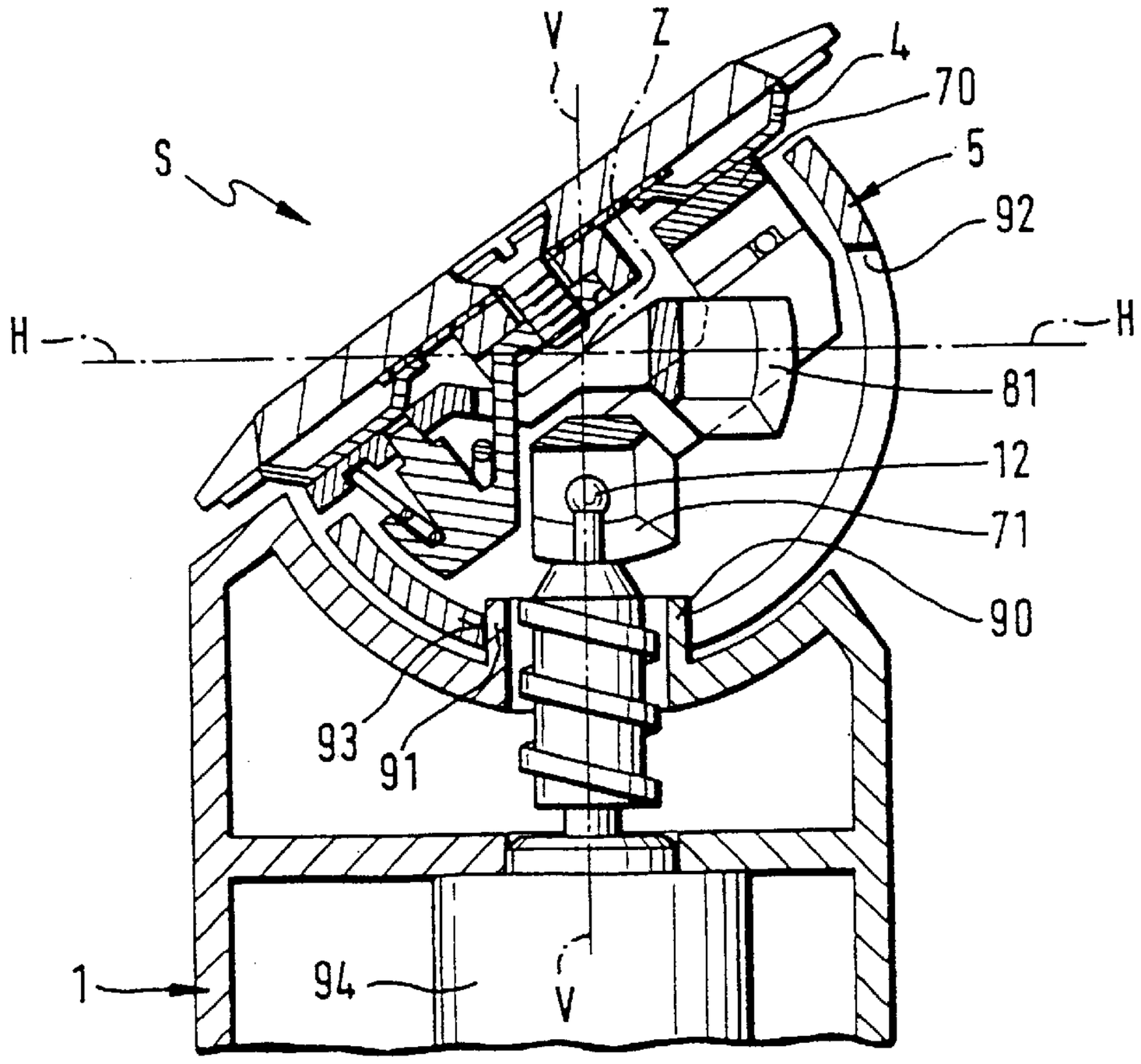
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Fig. 8

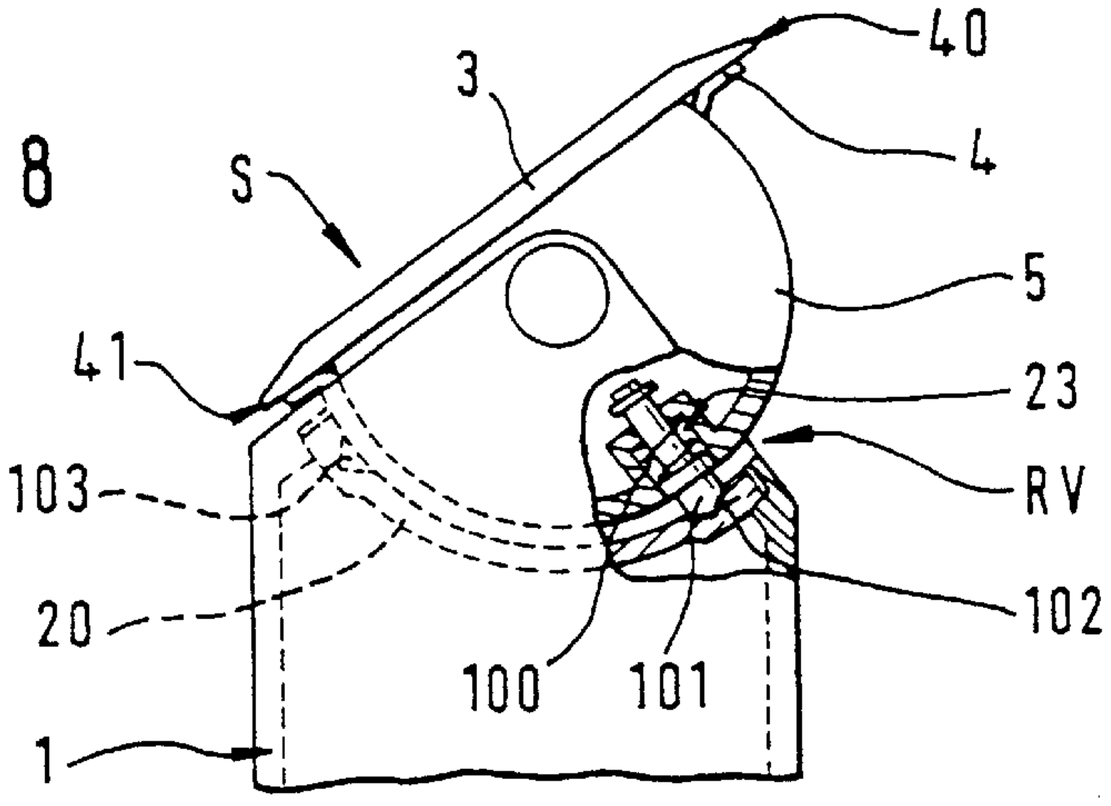

Fig. 9

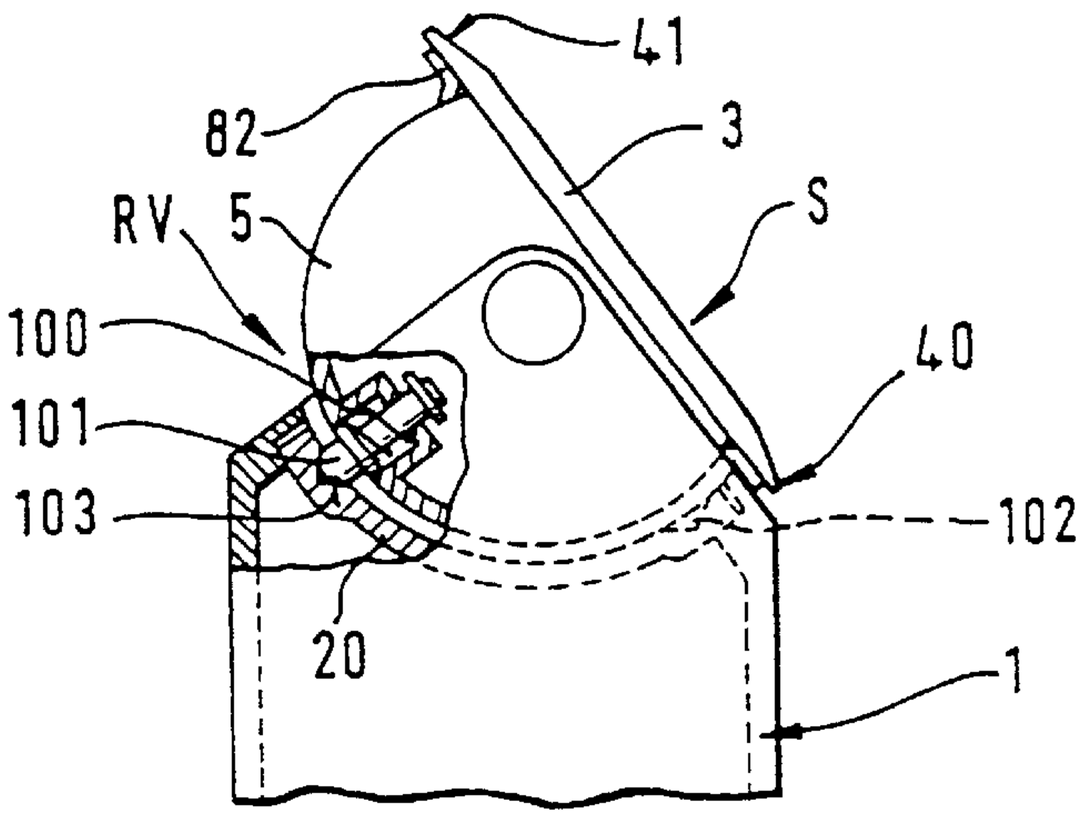

Fig. 10

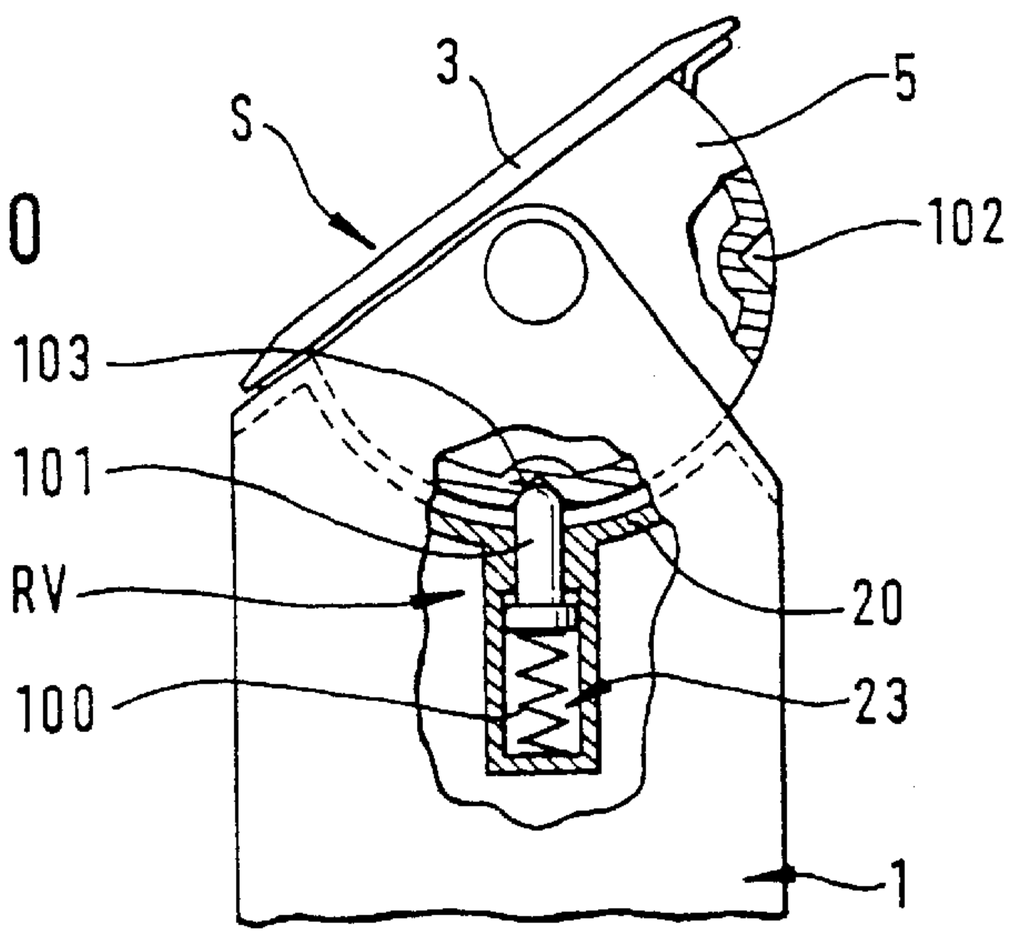

Fig. 11

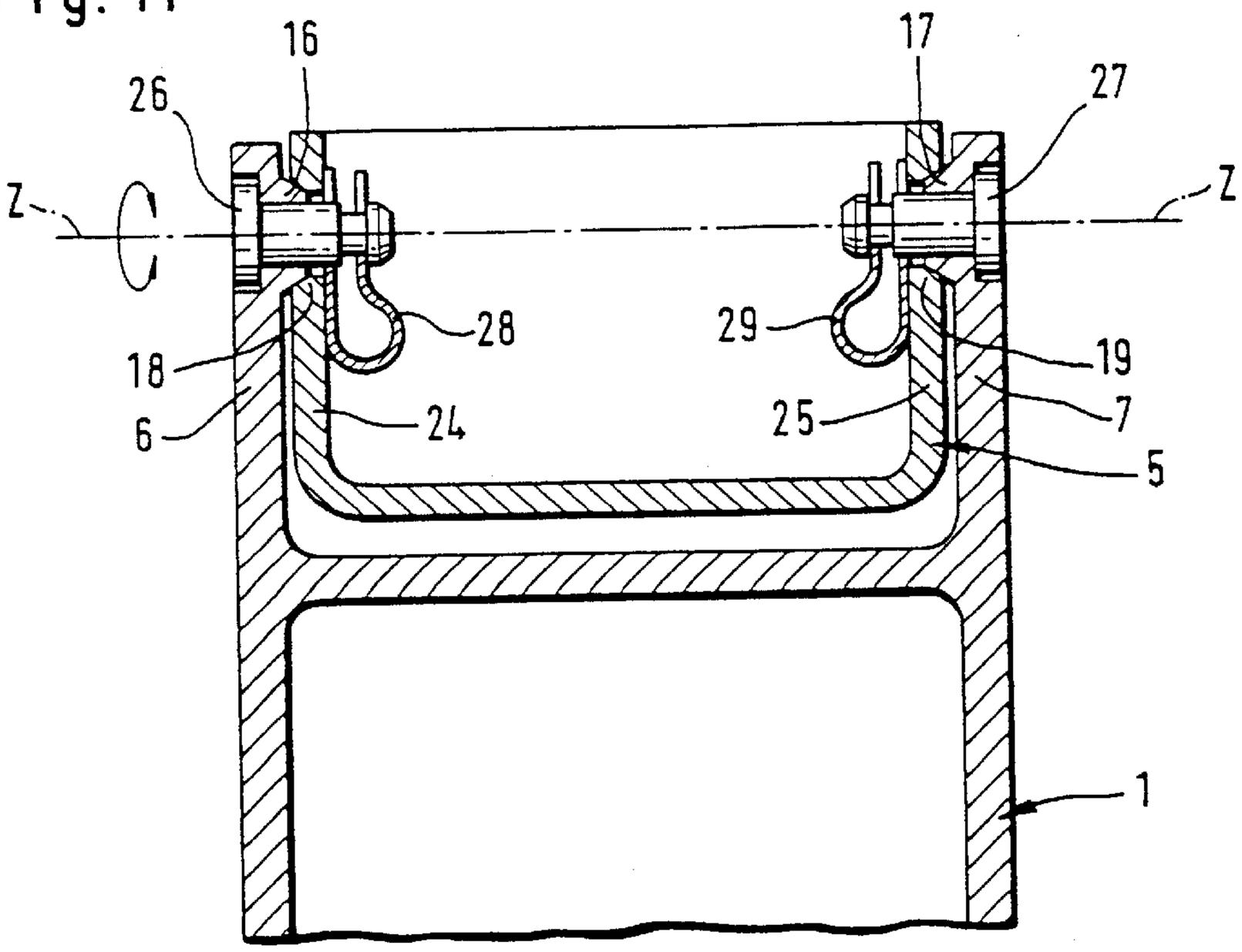
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Fig. 12

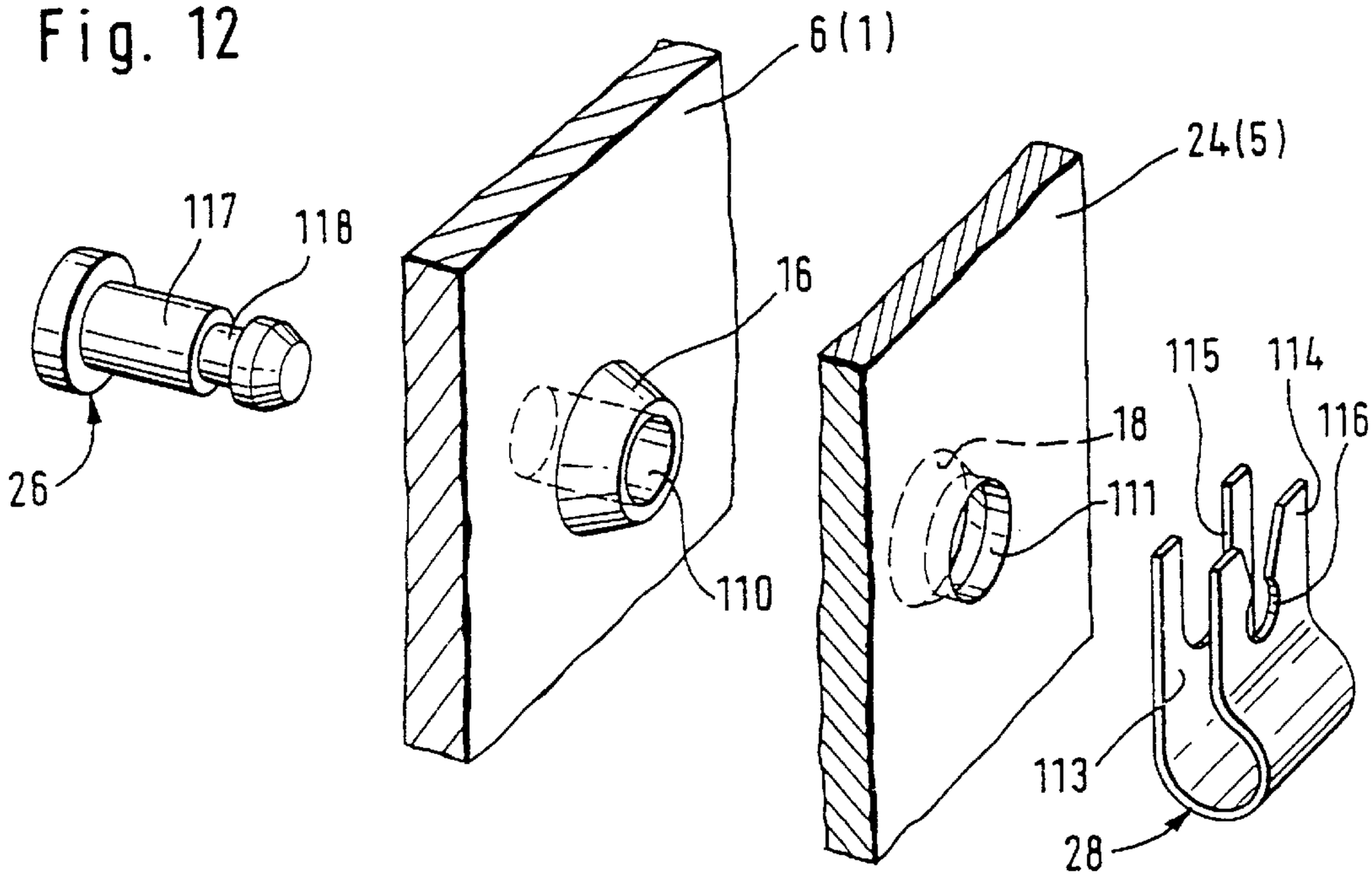
6(1)
24(5)
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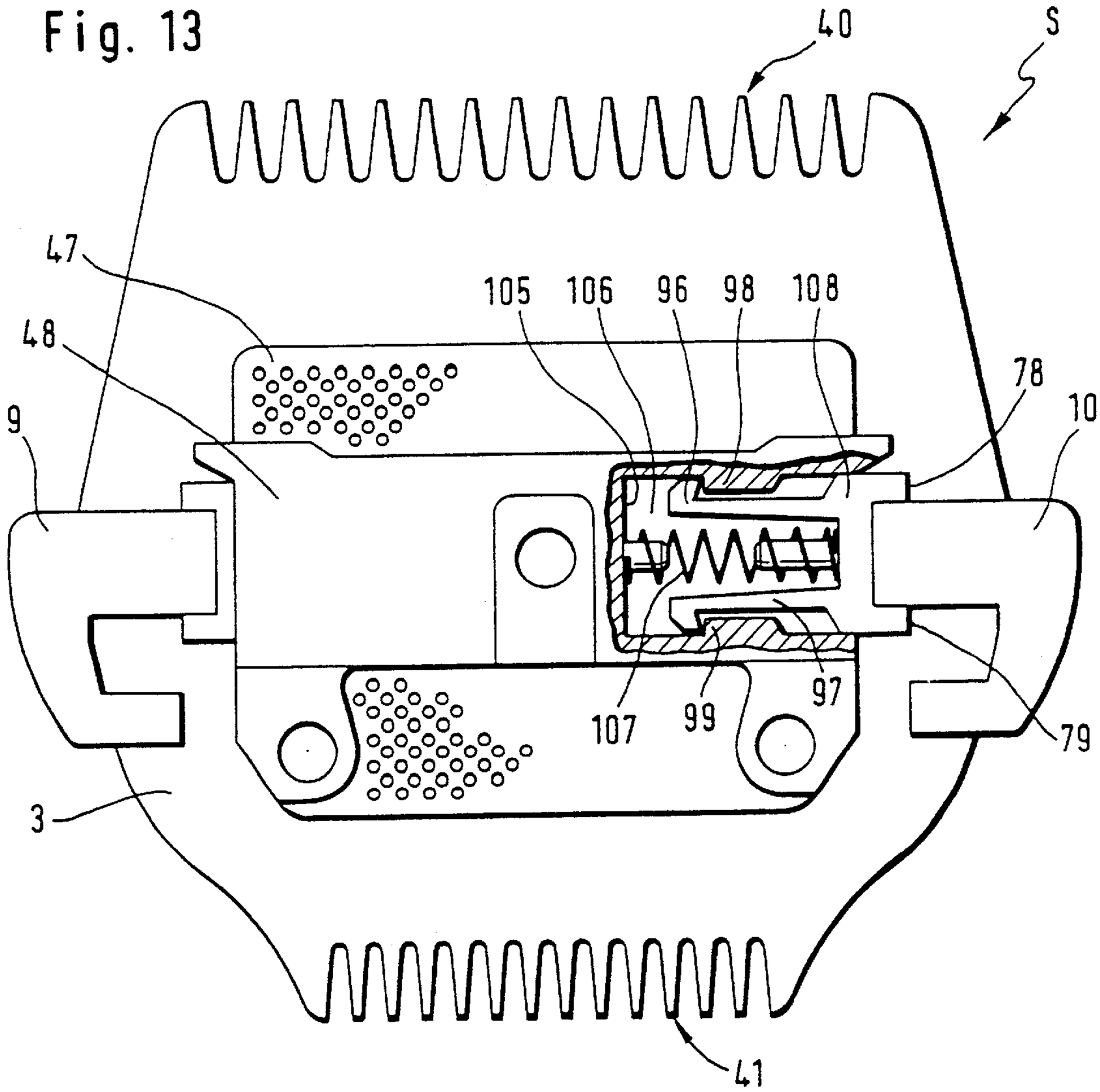
Fig. 13



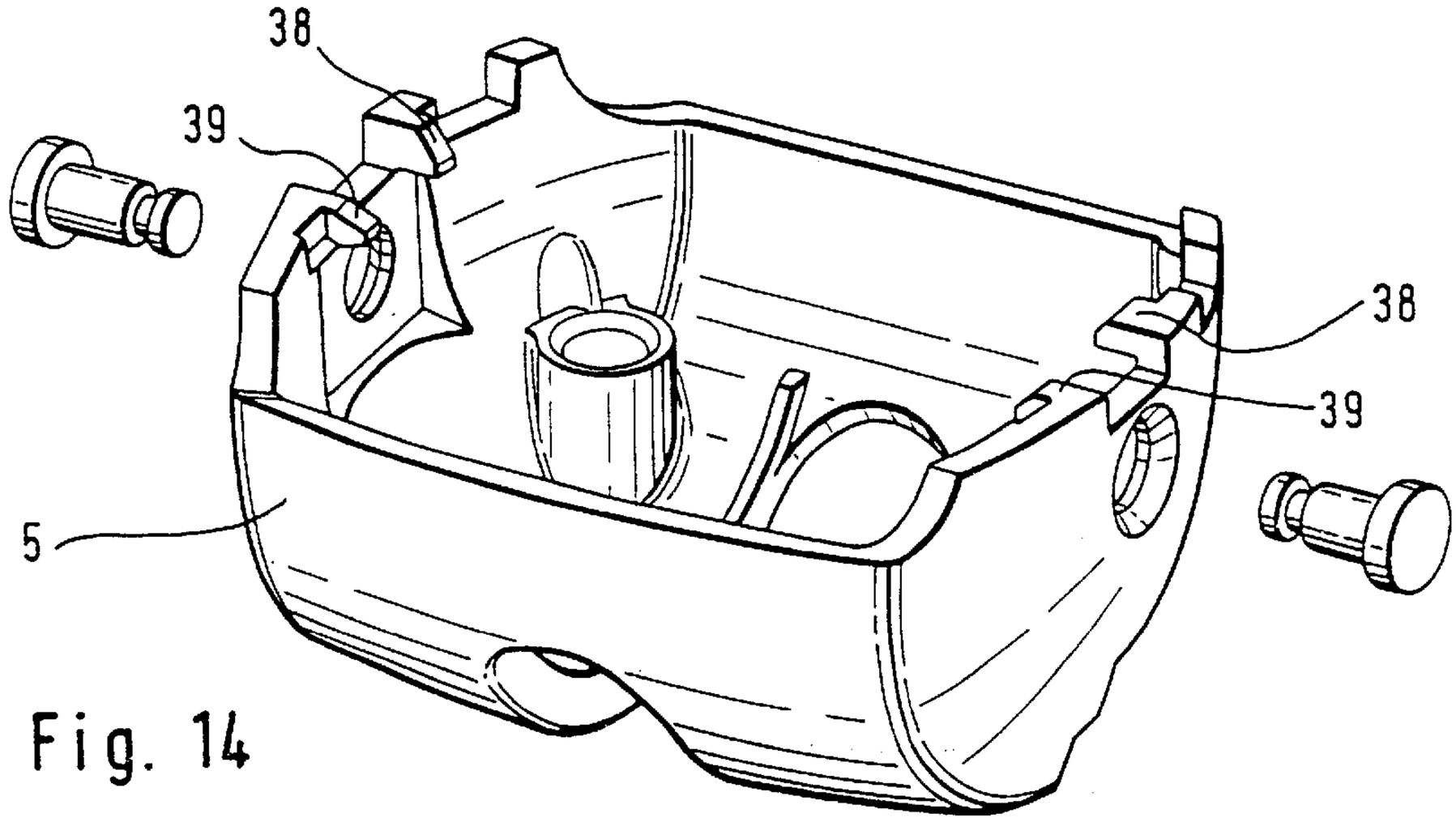


Fig. 14

POWER DRIVEN HAIR CLIPPER

This is a continuation of International Application PCT/EP99/08524, pending, with an International filing date of Nov. 6, 1999.

FIELD OF THE INVENTION

This invention relates to a power driven hair clipper.

BACKGROUND

A power driven hair clipper of the type initially referred to is known from U.S. Pat. No. 1,997,096, having a cutter head mounted for pivotal motion into corresponding positions for shaving and trimming, comprising a supporting element mounted for controlled pivotal motion along a curved track, a comb plate with only one row of teeth, and a cutter blade held in engagement with the comb plate by means of a resilient tension plate resting on the supporting element. An actuating element extending from the upper end of the casing transmits the driving motion to the cutter blade. A friction element acted upon by a spring element is arranged in the supporting element in such a way that it is urged against the upper surface of the hair clipper's casing in order to hold the cutter head in any given pivot position by frictional pressure engagement. For the cutter head to be displaceable from its position of adjustment, the predetermined frictional force has to be overcome. This can lead during clipper operation to undesirable changes of position, especially since frictional forces tend to decrease in the course of using the hair clipper.

A power driven hair clipper of the type initially referred to is further known from U.S. Pat. No. 2,741,026. The cutting head, formed by an outer blade and an inner cutting blade driven to oscillate, is rigidly fastened to the yoke arms of the casing head constructed in a U-shaped configuration. The arcuate shape of the outer blade with its two rows of cutting teeth permits the hair clipper and the outer blade fastened thereto to execute a restricted pivot movement of 9°, while the relatively large distance of the cutting head's row of teeth used at a time to the biggest diameter of the hair clipper's casing is intended to enable both rows of teeth to be used for trimming purposes.

From GB-A-2 294 230 there is known a power driven hair clipper with a cutter head mounted for pivotal motion in all directions, whose pivotability is assured by a ball and socket connection between the housing and the cutter head. The cutter head, comprised of a supporting element and a housing cover member, includes a pair of blades, each equipped with two rows of cutting teeth extending parallel to each other but arranged in the cutter head in such a way that only one of the cooperating rows of cutting teeth on the pair of blades projects out of the cutter head housing. For the second row of cutting teeth to be brought into use, the cutter head has to be opened to enable the pair of blades to be turned through 180° inside the cutter head.

From PCT-WO 98/47673 there is known a clipper head for a power driven hair clipper, comprising a supporting element, a clipper comb fastened thereto, and a clipper blade urged into engagement with the clipper comb via a driving element arranged to oscillate, under the action of a spring element bearing against the supporting element. A coupling element for transmitting the movement from the drive mechanism of the hair clipper to the clipper blade is provided on the driving element. To reduce the friction between the clipper comb and the clipper blade provision is made between the ends of the clipper comb and the clipper blade

on the side remote from the row of cutting teeth for a component made of a material displaying reduced friction properties. For cleaning and replacement purposes, the supporting element of the clipper head is attachable to the housing by means of a clip connection.

SUMMARY OF THE INVENTION

It is an object of the present invention to improve a power driven hair clipper of the type initially referred to in respect of its function and handling.

According to the invention this object is accomplished with a power driven hair clipper of the type initially referred to in that the clipper comb is in cooperating relationship with two clipper blades, each being adapted to be coupled with a drive member of the drive mechanism according to the pivot position of the clipper head relative to the housing. This invention has numerous advantages. One advantage is that, using a pivotal motion, the clipper head with its two rows of cutting teeth can be brought into an optimal cutting position relative to a skin surface and that, in such a pivot position, only one of the two clipper blades associated with the clipper comb is coupled with the drive member of an electric drive mechanism provided in the housing. This results in a reduction of power consumption because only that clipper blade intended to be used at any one time is driven to cooperate with the clipper comb. The cooperative relationship of two clipper blades with one clipper comb advantageously enables the rows of teeth of the clipper comb and the rows of teeth of the two clipper blades to be differently constructed, for example by having the width of one row of cutting teeth significantly smaller than the width of the other row of cutting teeth. Furthermore, it is also possible for the contour of one row of cutting teeth to be straight, for example, as opposed to an arcuate contour of the second row of cutting teeth opposite. Different constructions of this type enlarge the hair clipper's scope of use.

According to a preferred embodiment of the invention the clipper head is securable to a supporting element mounted on the housing for pivotal motion about the pivot axis. This arrangement guarantees that the clipper head can be easily and quickly coupled to and uncoupled from the pivotable supporting element of the hair clipper, thus making it possible to exchange clipper heads, to clean detached clipper heads and to replace clipper heads.

In a further aspect of the invention the supporting element is constructed as a housing shell. The housing shell advantageously surrounds the components of the clipper head fastened to the clipper comb, providing protection from damage.

One embodiment of the invention is characterized in that the housing shell is pivotally mounted on two opposing side walls of the housing. According to the invention one end of the housing is preferably constructed in a U-shaped yoke configuration, with the housing shell being pivotally mounted on the yoke arms of the housing by means of pivot bearings.

According to a preferred embodiment of the invention the it pivot bearings are formed by cooperating conical bearing elements. The cooperation of the conical bearing elements forming a conical bearing is promoted by having a bearing pin pass through the conical bearing. Optimal cooperation between the conical bearing elements and the bearing pin is guaranteed in that the bearing pin is movable against the pressure of at least one spring element.

According to yet another embodiment of the invention the clipper head is releasably attached to the supporting element

by means of a locking device. Actuation of the locking device en**25** sures easy and fast removal of the clipper head from the supporting element.

In a further embodiment of the invention a chassis is fastened to the clipper comb with its two rows of cutting teeth. In a further aspect of this embodiment provision is made for the chassis to act as the carrier of components of the locking device. In yet another aspect of this embodiment of the invention the chassis is provided with at least one locking device having a latching element movable against the pressure of a spring element. Preferably at least one latching element for the locking device is arranged on the supporting element.

A preferred embodiment of the invention is characterized in that the pivot range of the clipper head is limitable by stops. Preferably these stops are formed by wall elements.

According to a further advantageous embodiment of the invention the pivot range of the clipper head is locatable by means of a detent device. The detent device is preferably formed by at least one notch and one detent element adapted to be acted upon by a spring element.

According to yet another embodiment of the invention the spring element and the detent element are provided in the housing, and the notch is provided on an outer wall of the supporting element.

In a preferred embodiment the clipper head with the housing shell of the supporting element is pivotally mounted inside a housing head shell of the housing on the wall of the housing head shell. In a further aspect of this embodiment the directions of extension of the wall of the housing on either side of the pivot bearings are each aligned parallel to a maximal pivot angle of the clipper head. According to one embodiment of the invention the pivot angles of the clipper head are constructed to be of equal size. According to another embodiment of the invention the pivot angles of the clipper head are constructed to be of different size.

According to yet another embodiment of the invention the chassis is arranged on a foil resting on the clipper comb. According to a particularly advantageous embodiment of the invention the end of the clipper blade on the side remote from a row of cutting teeth is slidably held on the foil. To reduce the friction of the clipper blade on the foil provision is made in one embodiment of the invention for the foil to have a perforation. According to the invention the friction is further reduced by using the perforation as a receptacle for a lubricant. According to an embodiment of the invention the perforation is formed by holes. In another embodiment of the invention the perforation is formed by flanges.

An embodiment of the present invention will be described in the following with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front view of a power driven hair clipper having an actuating switch movable into various positions and a position switch;

FIG. **2** is an exploded view of the upper part of a power driven hair clipper comprising a detached supporting element, a clipper head having two rows of cutting teeth, and a distancing comb seatable onto the housing;

FIG. **3** is an exploded view of the components of a clipper head;

FIG. **3***a* is an exploded view of the components of the clipper head of FIG. **3**, including additionally a sectional view of the bearing bracket;

FIG. **4** is a side view of the clipper head, showing the clipper blade and a coupling element;

FIG. **5** is a cross-sectional view of the middle of the bearing bracket, the driving element, the clipper blades and the clipper comb;

FIG. **6** is a longitudinal sectional view of the upper part of the housing, showing a clipper head in abutment with a stop on the housing, and a row of cutting teeth in the position of use;

FIG. **7** is a longitudinal sectional view of the upper part of the housing, showing a clipper head in abutment with a stop on the housing, and respective rows of cutting teeth of the clipper comb and the clipper blade in the position of use;

FIG. **8** is a view of part of a housing, showing stops on the housing for abutting engagement with the pivoted clipper head and components of a detent device for the clipper head;

FIG. **9** is a view of part of a housing, showing stops on the housing for abutting engagement with the pivoted clipper head and components of a detent device for the clipper head;

FIG. **10** is a view of part of a housing, showing stops on the housing for abutting engagement with the pivoted clipper head and components of a detent device for the clipper head;

FIG. **11** is a longitudinal sectional view of the housing and the yoke arms provided thereon as well as of the supporting element in the area of the pivot bearings;

FIG. **12** is a view of details of a pivot bearing constructed in accordance with the embodiment of FIG. **11**;

FIG. **13** is a side view of the clipper comb with the chassis attached thereto and a foil, part of the chassis being broken away to expose components of the locking device; and

FIG. **14** is a perspective view of the supporting element showing latching elements.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. **1** shows the front view of a power driven hair clipper HSM with an actuating switch **2** adjustably arranged on the front panel of the housing **1**, a position switch **13** and a clipper head S which has a clipper comb **3** and a clipper blade **4** and is mounted on the housing **1** for pivotal motion about a pivot axis Z—see FIG. **2**. For this purpose one end of the housing **1** is of a U-shaped yoke configuration so that a supporting element **5** constructed as a housing shell and carrying the clipper head S is adapted to be pivotally mounted by means of pivot bearings on the yoke arms **6** and **7**. In the cylindrically shaped wall of the supporting element **5** provision is made for a cutout **8** to couple a drive member **12**—see FIG. **2**—of an electric drive mechanism provided in the housing **1** with a drivable clipper blade **4** according to the pivot position of the clipper head S relative to the housing **1**. The clipper head S is releasably attached to the supporting element **5** by means of a locking device **9**, **10**. At the end of the housing **1** remote from the clipper head S provision is made for an appliance socket **11** for the indirect and/or direct operation of the hair clipper HSM.

FIG. **2** is an exploded view of the upper part of a power driven hair clipper HSM showing the supporting element **5**, the clipper head S attachable thereto and a distancing comb **15** detached from the housing **1**. The upper end of the housing **1** is of a yoke-type construction, with conical bearing elements **16** and **17** being integrally formed on the yoke arms **6** and **7** in order to provide a pivot bearing in conjunction with the conical bearing elements **18** and **19** of the supporting element **5**. Between the two yoke arms **6** and

7 a housing head shell **20** is fastened to the housing **1** by means of fastening elements **21**. In the middle of the housing shell provision is made for an opening **22** through which the drive member **12** of an electric drive mechanism accommodated in the housing **1** extends.

The supporting element **5** is comprised essentially of a trough-shaped housing shell having a cutout **8** for passage of the electric drive member **12**, and of an integrally formed chamber **23** for accommodating the components of a detent device RV—see FIG. **8** to FIG. **10**. The conical bearing elements **18** and **19** are provided in opposite end walls **24** and **25** of the supporting element **5**. The supporting element **5** is held for pivotal motion about the pivot axis Z by means of bearing pins **26** and **27** and spring elements **28** and **29** and the conical bearing elements **16** and **17** as well as **18** and **19**.

The clipper head S is releasably attached to the supporting element **5** by means of at least one locking device **9, 10**—see FIGS. **1, 11, 13, 14**. The clipper comb **3** of the clipper head S has two rows of cutting teeth **40, 41** arranged opposite each other along the longitudinal sides of the clipper comb **3**. The row of cutting teeth **41** extends to a smaller width than the row of cutting teeth **40**. The heads of the illustrated fastening screws **30, 31** and **32** serve to fasten components of the clipper head S—in this connection see FIG. **3**.

FIG. **3** shows an exploded view of the clipper head S with a perspective view of the provided components. Two rows of cutting teeth **40** and **41** disposed in the opposing longitudinal sides of the clipper comb **3** are provided on the clipper comb **3**. The clipper comb **3** has three through-holes **44, 45** and **46** for passage of the fastening screws **30, 31** and **32**. Disposed on the inside of the clipper comb **3** is first a foil **47** with the through-holes **49, 50, 51** and then a chassis **48** with the through-holes **52, 53** and **54**. The relatively thin foil **47** has a plurality of small holes with or without flanges or beads to receive a lubricant. The chassis **48** is of a U-shaped configuration in order to receive a locking device **9, 10** described in more detail with reference to FIGS. **10** and **11**. The through-hole **54** is provided in the cross wall **37** of the U-shape joining the two longitudinal walls, whereas the through-holes **52** and **53** are provided in two lugs integrally formed on one of the longitudinal sides of the chassis **48**. A bearing bracket **60** with two bracket arms **61** and **62** is associated with the chassis **48**. Female threads **63** and **64** are provided in the bracket arms **61** and **62** in order to fasten to the clipper comb **3** the bearing bracket **60** and the chassis **48** by way of the through-holes **52** and **53**, and the foil **47** by way of the through-holes **49** and **50**, using the fastening screws **30** and **32** passing through the through-holes **46** and **44**. The bearing bracket **60** is additionally secured to the clipper comb **3** via a fastening arm **65** having a tapped hole **66** for threaded engagement with a fastening screw **31** passing through the through-hole **45** of the clipper comb **3**, the through-hole **51** of the foil **47** and the through-hole **54** of the chassis **48**.

On the side of the bearing bracket **60** remote from the clipper comb **3** provision is made for two bearing trunnions **67, 68** for pivotally mounting a driving element **70**. Fastened to the driving element **70** is a clipper blade **4** comprising a row of cutting teeth **42**. In addition to this, provision is made on the driving element for a coupling element **71** and two oscillating levers **72** and **73** pivotally mounting the driving element **70** by engagement of the bearing trunnions **67** and **68** of the bearing bracket **60** with the bearing bores **74** and **75**. The oscillating levers **72** and **73** are pivotally mounted on the driving element **70** by their ends opposite the bearing bores **74** and **75**, for example by way of pivot bearings comprised of bearing trunnions and bearing bores. Instead of pivot bearings comprised of bearing trunnions and bearing bores it is also possible to use, for example, film hinge joints as pivot bearings.

The clipper blade **4** fastened to the driving element **70** has on its side close to the inside of the clipper comb **3***a* groove-like recess, whereby two engagement surfaces **A1, A2** are produced—see FIG. **3***a*—in order to reduce the area making sliding contact with the inside of the clipper comb **3**. In the assembled state the row of cutting teeth **42** of the clipper blade **4** makes engagement with the row of cutting teeth **40** of the clipper comb **3**, while the end of the clipper blade **4** opposite the row of cutting teeth **42** makes engagement with the foil **47** in order to slide to and fro on the foil **47** during operation of the clipper blade **4**. To minimize friction occurring in the process between the relatively narrow projecting area of the clipper blade **4** and the foil **47**, a lubricant is stored either in the holes of the foil **47** or in recesses formed by flanges surrounding the holes. The sliding bearing of the clipper blade **4** against the relatively narrow area of engagement with the foil **47** results in a slight inclination of the clipper blade **4** on the planar inside of the clipper comb **3** relative to the rows of cutting teeth **40** and **42**, thereby effecting an optimal cooperation between the row of cutting teeth **40** of the clipper comb **3** and the row of cutting teeth **42** of the clipper blade **4** for the cutting of hair.

Integrally formed on the driving element **70** are two yoke arms **55** and **56** for receiving the spring arms **76, 77** of a spring element **57** fastened to the bearing bracket **60** by means of a spring arm **58** reaching under the fastening arm **65**. The necessary contact pressure to effect cooperation of the clipper comb **3** with the clipper blade **4** is exerted on the clipper blade **4** by means of the spring arms **76** and **77** of the spring element **57** acting via the yoke arms **55** and **56** of the driving element **70**.

On a driving element **80** provision is made for a coupling element **81** to operate the clipper blade **82** which has a row of cutting teeth **43** and is fastened to the driving element **80**, and on a longitudinal web portion **83** of the driving element **80** provision is made for a bearing bore **84** for pivotally mounting the driving element **80** and the clipper blade **82**. Between the bearing bore **84** and the coupling element **81** provision is made for an opening **85** through which, in the assembled state of the bearing bracket **60** and the driving element **80**, the fastening arm **65** of the bearing bracket **60** is passed. In the assembled state of the clipper head S the coupling element **81** is provided adjacent to the coupling element **71**.

Details of the pivotable bearing of the driving element **80** with the clipper blade **82** are shown in FIG. **3***a* and are described in more detail below. In contrast to FIG. **3**, the presentation of the bearing bracket **60** of FIG. **3***a* shows a section through the middle of the bar extending in longitudinal direction, thereby providing a clear view of the bearing trunnion **86** required for the pivotal motion of the driving element **80**, and a spring chamber **87**. With the driving element **80** in the assembled state the bearing trunnion **86** engages in the bearing bore **84** in order to set the driving element **80** with the attached clipper blade **82** in a reciprocating pivotal motion when the coupling element **81** is coupled with the drive member **12**—see FIG. **2**. The necessary contact pressure of the row of cutting teeth **43** of the clipper blade **82** is exerted on the row of cutting teeth **41** of the clipper comb **3** by means of a spring element **89** seated in the spring chamber **87** in addition to having its spring legs seated in the groove-shaped spring seat **88** provided in the web portion of the driving element **80**.

Like the clipper blade **4**, the clipper blade **82** has a groove-like recess, thus forming two engagement surfaces

A1, A2 with the clipper comb **3**, whereby in the assembled state of the clipper head S the engagement surface A2 of the clipper blade **82** extending opposite to the row of cutting teeth **43** comes into sliding contact with the foil **47**. The relatively narrow engagement surface A2 of the clipper blade **82** results, upon engagement with the foil **47**, in a slight inclination of the clipper blade **82** relative to the row of cutting teeth **43** of the clipper comb **3**, thus effecting an optimal cooperation of the row of cutting teeth **43** of the clipper blade **82** with the row of cutting teeth **41** of the clipper comb **3** for cutting hair. This arrangement leads to a reduction in size of cooperating friction surfaces, the overall friction being significantly reduced by the holes in the foil **47** or by grooves formed in the foil by means of flanges or bars. A further reduction of friction is achieved by disposing a lubricant in either the holes or grooves or recesses in the foil **47**.

FIGS. **4** and **5** show further details of the arrangement of the spring element **89** in the spring chamber **87** and the spring seat **88** constructed as a groove. FIG. **4** shows a view of the cutting teeth of the clipper comb **3** and the clipper blade **82** as well as the bearing bracket **60**, in whose spring chamber **87** a spring element **89** configured as a leg spring is received and captured. The two legs of the leg spring extend into the groove of the spring seat **88**, urging the clipper blade **82**, by way of the driving element **80**, against the row of cutting teeth **41** of the clipper comb **3**. The coupling element **81** is arranged between the two bearing trunnions **67** and **68** and capable of reciprocating.

FIG. **5** shows a cross section through the middle of the bearing bracket **60**, the driving element **80**, the clipper blade **82** and the clipper comb **3** of the clipper head S. The cross section also shows the engagement of the spring element **89** with a wall of the spring chamber **87** and, in addition, with a wall of the groove-shaped spring seat **88** provided in the driving element **80**. The contact pressure of the spring element **89** operates to hold the clipper blade **82** with its row of cutting teeth **43** in engagement with the row of cutting teeth **41** of the clipper comb **3**, in addition to causing the opposite narrow area of the clipper blade **82** to be maintained in engagement with the foil **47** resting on the clipper comb **3**. The clipper blade **82** with the driving element **80** is pivotally mounted on the bearing bracket **60** by means of the bearing trunnion **86** provided on the bearing bracket **60**, and the coupling element **81** provided on the driving element **80**—see FIG. **4**—transmits the driving motion from the drive mechanism of the power driven hair clipper HSM to the clipper blade **82**. The bearing bracket **60** is fastened by means of a fastening arm **65**—in this connection see FIG. **3***a*—to the clipper comb **3** by means of a fastening screw **31**.

FIGS. **6** and **7** show a cross section through the middle of the clipper head S and the upper part of the housing **1**, from which it will be seen that the respective position of the clipper head S and hence of the cutting system being put to use, comprised of a clipper comb **3** and clipper blades **4** and **82**, is defined by stops which are formed, for example, by wall elements **90** and **91** of the housing **1** and by wall elements **92** and **93** of the supporting element **5**. The wall elements **92** and **93** are formed, for example, by means of an elongate cutout **8** provided in the housing shell of the supporting element **5**. Arranged in the housing **1** is an electric motor **94** whose drive member **12**, configured as an eccentric, engages in the coupling element **81** in order to drive the cutting system, which is in operating position, of the clipper head S comprised of the clipper comb **3** and the clipper blade **82**. The coupling element **71** provided to drive the clipper blade **4** is disengaged from the drive member **12**.

The operating position of the row of cutting teeth **43** of the clipper blade **82** cooperating with the row of cutting teeth **41** of the clipper comb **3** is defined according to FIG. **6** by abutment of the wall element **92** of the supporting element **5** with the wall element **90** of the housing head shell **20** of the housing **1**. In the embodiment of FIG. **6** the bearing bracket **60** and the chassis **48** and the foil **47** are fastened to the planar inner surface of the clipper comb **3** by means of the fastening screw **31**. The clipper blade **4** fastened to the driving element **70** and the clipper blade **82** fastened to the driving element **80** bear with their longitudinally extending engagement surfaces A2, A1 against the foil **47** and, on account of the thickness of the foil **47**, adopt a slight inclination toward their rows of cutting teeth **42** and **43**, respectively.

In contrast to the representation of FIG. **6**, the clipper head S in the embodiment of FIG. **7** is pivoted by a predetermined angle relative to a vertical axis V and a horizontal axis H about the pivot axis Z, whereby the wall element **93** comes to rest against the wall element **91**. In this position of the clipper head S the drive member **12**, constructed as an eccentric, of the electric motor **94** is coupled with the coupling element **71**, causing the driving motion of the electric motor **94** to be transmitted in the activated state via the provided driving element **70** to the clipper blade **4** so that the clipper head S, then in operating position, can be used to cut hair.

FIGS. **8**, **9** and **10** show detent devices RV enabling the clipper head S to be maintained in various operating positions, particularly at an optimal angle of application to the skin. FIG. **8** shows the upper part of a housing **1** with a pivotally mounted supporting element **5** which is coupled to a clipper head S. A chamber **23** for receiving a spring element **100** and a detent element **101** is provided in the supporting element **5** constructed as a housing shell. In the housing head shell **20** of the housing **1** provision is made for at least two notches **102** for receiving the detent element **101** and hence for locating the clipper head S in its pivot position. In the embodiment of FIG. **8** the detent element **101** is in engagement with the notch **102**, thereby defining the operating position of the clipper blade **4** with the cooperating row of cutting teeth **40**. In the embodiment of FIG. **9** the detent element **101** is in engagement with the notch **103** provided in the housing head shell **20**, thereby defining the operating position of the clipper blade **82** with the row of cutting teeth **41** of the clipper comb **3**. In the embodiment of FIG. **10** the chamber **23**, the spring element **100** and the detent element **101** are provided in the housing **1**, the detent element **101** extending through the wall of the housing head shell **20** and projecting into a notch **103** provided in the housing shell of the supporting element **5** in order to arrest the clipper head S in one of the provided operating positions. A further operating position is provided by the notch **102** in the outer wall of the housing shell of the supporting element **5**.

FIGS. **11** and **12** show details of the bearing structure of the supporting element **5** on wall elements of the housing **1**, which are described below in more detail. The supporting element **5** with its end walls **24** and **25** is arranged between the yoke arms **6** and **7** of the housing **1** and pivotally mounted about the pivot axis Z by means of two pivot bearings. The two pivot bearings are identically constructed, comprising respectively a bearing pin **26**, **27**, a spring element **28**, **29** and conical bearing elements **16**, **18** and **17**, **19**. Details of the bearing structure are shown in FIG. **12** in an exploded view and are described below in more detail. The bearing pin **26** includes a journal **117** and a groove **118**.

Integrally formed on the yoke arm **6** is a conical bearing element **16** through which a bore **110** passes. The conical bearing element **18** is formed in the end wall **25** of the supporting element **5** by an integrally formed cone-like depression through it which a bore **111** also passes. The spring element **28** is of a U-shaped configuration, providing legs **113** and **114** having a cutout **115** to allow passage of the bearing pin **26** and another cutout **116** to fasten the leg **114** in the groove **118** of the bearing pin **26**. FIG. **11** shows the bearing structure of FIG. **12** in the assembled state in which the conical bearing elements **16** and **18** are held in slidable relative engagement by means of the spring tension of the spring element **28** in conjunction with the bearing pin **26**. The opposite lying pivot bearing is of identical construction.

FIG. **13** shows a view of the inside of the clipper comb **3** with the foil **47** and the chassis **48** fastened thereto, as well as with a locking device **10** arranged in the interior of the U-shaped chassis **48**—see FIG. **3**. The chassis **48** is shown in a partly broken away view to expose the components of the locking device **10** comprised of a spring element **107** resting against a wall **105** of the chassis chamber **106**, and a locking element **108** acted upon by the spring element **107**. With two hook-shaped resilient legs **96**, **97** the locking element **108** is held under the spring action of the spring element **107** against two holding lugs **98** and **99** provided on the inner wall of the chassis chamber **106** and is arranged for movement in the direction of the wall **105** of the chassis chamber **106** in opposition to the pressure of the spring element **107**.

Integrally formed on the locking element **108** is at least one latching element **78**, **79** which, when latched with the supporting element **5**, reaches behind at least one latching element **38**, **39**, thus effecting a releasable attachment of the clipper head S to the supporting element **5**. The latching elements **78** and **79** are disengaged from the latching elements **38** and **39** by actuating the pushbuttons of the locking device **9** and **10** on which the latching elements **78** and **79** are provided—see FIG. **14**—thus enabling the clipper head S to be taken off the supporting element **5**.

We claim:

1. A power driven hair clipper, comprising a drive mechanism provided in a housing **(1)** and a clipper head (S) comprising a clipper comb **(3)** in cooperating relationship with first and second clipper blades **(4, 82)**, said clipper head being mounted on said housing **(1)** for selectable pivotal motion about a pivot axis between at least first and second pivoted positions, whereby alternately one of said first and second clipper blades **(4, 82)** is coupled with said drive mechanism according to the selected respective pivoted position of the clipper head (S) relative the housing **(1)**, and

wherein the clipper head is supported on the housing by pivot bearings formed by cooperating bearing elements **(16, 17, 18, 19)** relatively movable against the pressure of at least one spring element **(28, 29)**.

2. The hair clipper as claimed in claim **1**, wherein the clipper head (S) is secured to a supporting element **(5)** mounted on the housing **(1)** for pivotal motion about the pivot axis.

3. The hair clipper as claimed in claim **2**, wherein the supporting element **(5)** is constructed as a housing shell.

4. The hair clipper as claimed in claim **3**, wherein an end of the housing **(1)** defines two opposing side wall, and the housing shell is pivotally mounted on the two opposing side walls of the housing **(1)**.

5. The hair clipper as claimed in claim **3**, wherein an end of the housing **(1)** defines a U-shaped yoke, and the housing shell is pivotally mounted on yoke arms **(6, 7)** of the housing **(1)** by pivot bearings.

6. The hair clipper as claimed in claim **1**, wherein the cooperating bearing elements **(16, 17, 18, 19)** supporting the clipper head on the housing are formed by cooperating conical bearing elements.

7. The hair clipper as claimed in claim **6**, wherein a bearing pin **(26, 27)** passes through the conical bearing.

8. The hair clipper as claimed in claim **7**, wherein the bearing pin **(26, 27)** is movable against the pressure of said at least one spring element **(28, 29)**.

9. A power driven hair clipper, comprising a drive mechanism provided in a housing **(1)** and a clipper head (S) comprising a clipper comb **(3)** in cooperating relationship with first and second clipper blades **(4, 82)**, said clipper head being mounted on said housing **(1)** for selectable pivotal motion about a pivot axis between at least first and second pivoted positions, whereby alternately one of said first and second clipper blades **(4, 82)** is coupled with said drive mechanism according to the selected respective pivoted position of the clipper head (S) relative the housing **(1)**,

wherein the clipper head (S) is secured to a supporting element **(5)** mounted on the housing **(1)** for pivotal motion about the pivot axis, and

wherein the clipper head (S) is releasably attached to the supporting element **(5)** by a locking device **(9, 10)**.

10. A power driven hair clipper, comprising a drive mechanism provided in a housing **(1)** and a clipper head (S) comprising a clipper comb **(3)** in cooperating relationship with first and second clipper blades **(4, 82)**, said clipper head being mounted on said housing **(1)** for selectable pivotal motion about a pivot axis between at least first and second pivoted positions, whereby alternately one of said first and second clipper blades **(4, 82)** is coupled with said drive mechanism according to the selected respective pivoted position of the clipper head (S) relative the housing **(1)**,

wherein the clipper comb **(3)** has two rows of cutting teeth **(40, 41)**.

11. The hair clipper as claimed in claim **10**, further comprising a chassis **(48)** fastened to the clipper comb.

12. The hair clipper as claimed in claim **11**, wherein the chassis **(48)** is provided with at least one locking device **(9, 10)** having a latching element **(78, 79)** movable against the pressure of a latch spring element **(107)**.

13. The hair clipper as claimed in claim **9**, further comprising at least one latching element **(38, 39)** for the locking device **(9, 10)**, said latching element being disposed on the supporting element **(5)**.

14. The hair clipper as claimed in claim **1**, wherein a pivot range of the clipper head (S) is limited by stops.

15. The hair clipper as claimed in claim **14**, wherein said stops are formed by cooperating wall elements **(90, 92; 91, 93)** formed respectively on the clipper head and on the housing **(1)**.

16. The hair clipper as claimed in claim **1**, wherein a pivot range of the clipper head (S) is determined by a detent device (RV).

17. A power driven hair clipper, comprising a drive mechanism provided in a housing **(1)** and a clipper head (S) comprising a clipper comb **(3)** in cooperating relationship with first and second clipper blades **(4, 82)**, said clipper head being mounted on said housing **(1)** for selectable pivotal motion about a pivot axis between at least first and second pivoted positions, whereby alternately one of said first and second clipper blades **(4, 82)** is coupled with said drive mechanism according to the selected respective pivoted position of the clipper head (S) relative the housing **(1)**,

wherein a pivot range of the clipper head (S) is determined by a detent device (RV), and wherein the detent

device (RV) is formed by at least one notch (**102**) and one detent element (**101**) adapted to be biased by a detent spring element (**100**).

18. The hair clipper as claimed in claim **17**, wherein the detent spring element (**100**) and the detent element (**101**) are provided in the housing, and the notch (**102**) is provided on an outer wall of the clipper head.

19. The hair clipper as claimed in claim **3**, wherein the clipper head (S) with the housing shell of the supporting element (**5**) is pivotally mounted inside a housing head shell (**20**) of the housing (**1**) on a wall of the housing head shell (**20**).

20. The hair clipper as claimed in claim **1**, wherein the clipper head is mounted by pivot bearings to the housing, and directions of extension of a wall of the housing (**1**) on either side of the pivot bearings are each aligned parallel to a maximal pivot angle of the clipper head (S).

21. The hair clipper as claimed in claim **20**, wherein the pivot angles of the clipper head (S) on respective sides of the pivot bearings are of equal size.

22. The hair clipper as claimed in claim **20**, wherein the pivot angles of the clipper head (S) on respective sides of the pivot bearings are of different size.

23. The hair clipper as claimed in claim **11**, wherein the chassis (**48**) is disposed on a foil (**47**) which is disposed on the clipper comb (**3**).

24. The hair clipper as claimed in claim **23**, wherein at least one clipper blade (**4**, **82**) has a row of cutting teeth (**42**, **43**), and an end portion of said at least one clipper blade spaced from said row of cutting teeth is in sliding contact with the foil (**47**).

25. The hair clipper as claimed in claim **23**, wherein the foil (**47**) has a perforation.

26. The hair clipper as claimed in claim **25**, wherein the perforation defines a receptacle for a lubricant.

27. The hair clipper as claimed in claim **25**, wherein the perforation is defined by holes.

28. The hair clipper as claimed in claim **23**, wherein the perforation is defined by flanges.

29. The hair clipper as claimed in claim **1**, wherein the pivot axis extends lateral of the housing.

30. The hair clipper as claimed in claim **29**, wherein the pivot axis extends generally parallel a longitudinal extent of at least one of the clipper blades.

31. A power driven hair clipper, comprising

a drive mechanism provided in a housing (**1**), and

a clipper head (S) comprising a clipper comb (**3**) in cooperating relationship with first and second moving clipper blades (**4**, **82**),

wherein the clipper comb has two rows of cutting teeth along opposing edges of the comb, the first clipper blade being in cooperating relationship to a first said row of comb teeth, the second clipper blade being in cooperating relationship to a second said row of comb teeth,

said clipper head being mounted on said housing (**1**) for selectable displacement between at least first and second operating positions,

whereby in said first operating position said first clipper blade (**4**) is coupled with said drive mechanism and said second clipper blade is decoupled from said drive mechanism,

and in said second operating position said second clipper blade (**82**) is coupled with said drive mechanism and said first clipper blade is decoupled from said drive mechanism.

32. The hair clipper as claimed in claim **31**, wherein the clipper head is mounted on said housing for pivotal motion about a pivot axis, said first and second operating positions corresponding to first and second pivoted positions.

33. The hair clipper as claimed in claim **32**, wherein the pivot axis extends lateral of the housing.

34. The hair clipper as claimed in claim **32**, wherein the pivot axis extends generally parallel a longitudinal extent of at least one of said clipper blades.

35. The hair clipper as claimed in claim **31**, wherein the clipper head is latchable in either of said first and second operating positions.

36. A method of engaging one of a plurality of clipper blades of a power driven hair clipper selectively by a user, comprising the steps of

providing a drive mechanism in a housing, and a clipper head comprising a clipper comb in cooperating relationship with first and second moving clipper blades,

providing at least two rows of teeth on said clipper comb, said first row of comb teeth being in cooperating engagement with said first clipper blade and said second row of comb teeth being in cooperating engagement with said second clipper blade,

mounting said clipper head for displacement on said housing,

moving said clipper head relative the housing to a first operating position,

coupling, in said first operating position, said first clipper blade with said drive mechanism and decoupling said second clipper blade from said drive mechanism, and then

moving said clipper head relative the housing to a second operating position,

decoupling, in said second operating position, said first clipper blade from said drive mechanism and coupling said second clipper blade with said drive mechanism,

whereby a user can selectively choose said first and second operating positions.

37. The method of claim **36**, wherein the clipper head is mounted on said housing for pivotal motion about a pivot axis, said first and second operating positions corresponding to first and second pivoted positions.

38. The method of claim **37**, wherein the pivot axis extends lateral of the housing.

39. The method of claim **37**, wherein the pivot axis extends generally parallel a longitudinal extent of at least one of said clipper blades.

40. The method of claim **36**, further comprising the step of latching the the clipper head in either of said first and second operating positions.

41. The hair clipper as claimed in claim **17**, wherein the detent spring element (**100**) and the detent element (**101**) are provided in the clipper head, and the notch (**102**) is provided in the housing.

42. The hair clipper as claimed in claim **11**, herein the clipper head (S) is secured to a supporting element (**5**) mounted on the housing (**1**) for pivotal motion about the pivot axis,

the clipper head (S) is releasably attached to the supporting element (**5**) by a locking device (**9**, **10**), and

the chassis (**48**) carries at least a portion of the locking device (**9**, **10**).

43. The hair clipper as claimed in claim **10**, wherein a first row of said comb cutting teeth is wider than a second row of said comb cutting teeth.

44. The hair clipper as claimed in claim **10**, wherein a first row of said comb cutting teeth is constructed differently than a second row of said comb cutting teeth.

45. The hair clipper as claimed in claim **44**, wherein the first row **(41)** of said comb cutting teeth has a greater pitch than the second row **(40)** of said comb cutting teeth.

46. The hair clipper as claimed in claim **31**, wherein said first row of comb cutting teeth is wider than a second row of said comb cutting teeth.

47. The hair clipper as claimed in claim **31**, wherein a first row of said comb cutting teeth is constructed differently than a second row of said comb cutting teeth.

48. The hair clipper as claimed in claim **47**, wherein the first row **(41)** of said comb cutting teeth has a greater pitch than the second row **(40)** of said comb cutting teeth.

49. The method of claim **36**, further comprising the step of providing said first row of comb cutting teeth wider than said second row of comb cutting teeth.

50. The method of claim **36**, further comprising the step of constructing said first row of comb cutting teeth differently than said second row of comb cutting teeth.

51. The method of claim **50**, wherein the first row **(41)** of comb cutting teeth is constructed having a greater pitch than the second row **(40)** of comb cutting teeth.

52. The hair clipper as claimed in claim **1**, wherein the clipper comb **(3)** is formed in one piece.

53. The hair clipper as claimed in claim **10**, wherein the clipper comb **(3)** is formed in one piece.

54. The hair clipper as claimed in claim **31**, wherein the clipper comb **(3)** is formed in one piece.

55. The method of claim **36**, wherein the clipper comb **(3)** is formed in one piece.

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